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**UNITED STATES DEPARTMENT OF COMMERCE****United States Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/217,740 12/21/98 CAD

M 10961260-1

EXAMINER

MM91/0515

AGILENT TECHNOLOGIES
LEGAL DEPARTMENT, 51UPO
INTELLECTUAL PROPERTY ADMINISTRATION
P.O. BOX 58043
SANTA CLARA CA 95052-8043

OWENS, D

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

05/15/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.

09/217,740

Applicant(s)

CAO ET AL.

Examiner

Douglas W Owens

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 1998 is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the trench isolation structure having a protective wall comprising an oxide wall and a nitride wall, further including an inner sealing wall located exclusively in the shallow region of the trench, as required by dependent claim 6, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.
2. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect can be deferred until the application is allowed by the examiner.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 6 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification only discloses an isolation trench having a shallow region and a deep region, further comprising a protective oxide wall and nitride sealing wall. The specification does not disclose an embodiment comprising a

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protective wall comprising an oxide wall and a nitride wall in addition to sealing wall located exclusively in the shallow region of the trench.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2 and 4-6 rejected under 35 U.S.C. 103(a) as being unpatentable over US patent No. 4,551,743 to Murakami in view of US patent No. 4,502,913 to Lechaton et al.

Regarding claims 1 and 5, Murakami teaches a semiconductor isolation structure comprising (Fig. 1 & 3):

a substrate with a surface;

a first and second device formed within the substrate;

an isolation region between the first and second devices, said isolation region comprising:

a deep region with a cross sectional area;

a shallow region that extends to the surface of the substrate;

a protective wall (13) adjacent the substrate; and

the shallow region having a cross-sectional area that is smaller than the cross-sectional area of the deep region.

Murakami does not teach an inner sealing wall located exclusively within the shallow region of the trench and adjacent the protective wall. Lechaton et al. teaches an isolation structure having a shallow and a deep region, wherein the shallow region includes an inner sealing wall (24) formed exclusively in the shallow region adjacent the protective wall. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Lechaton et al. into the device taught by Murakami, since it is desirable to provide a diffusion barrier, and protect device regions from subsequent oxidation steps.

Regarding claim 2, Murakami teaches an isolation region, wherein the isolation region comprises an oxide.

Regarding claim 4, Murakami teaches an isolation structure, wherein the protective wall comprises an oxide.

Regarding claim 6, Murakami teaches an isolation structure, wherein the protective wall comprises an oxide wall. Murakami does not teach a structure, wherein the protective wall comprises an oxide wall and a nitride wall. Lechaton et al. teaches an isolation structure, wherein the protective wall includes a nitride wall (26). It would have been obvious to incorporate the teaching of Lechaton et al. into the device taught by Murakami for reasons discussed above.

Response to Arguments

7. Applicant's arguments with respect to claims 5 and 6 have been considered but are moot in view of the new ground(s) of rejection.


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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 703-308-6167. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


TOM THOMAS
SUPERVISORY PATENT EXAMINER

DWO
May 9, 2001